

CLAIMS

1. A method of locating a center of a femoral head of a human leg of a patient having a femur, knee joint with a distal femur, tibia and femoral head, the method including the steps of:

- a. mounting a laser beam generator on said knee joint;
- b. shining a laser beam emanating from said generator toward a target located adjacent said femoral head;
- c. aligning said laser beam with respect to said target to locate said center of said femoral head.

2. The method of Claim 1, before said mounting step, including the step of locating the patient on a surgical table by:

- a. placing said patient on said surgical table;
- b. installing a clamp on said table;
- c. attaching a target positioner on said clamp;
- d. lifting said patient's thigh to a position perpendicular to said table and moving said patient so that said thigh in said perpendicular position engages said target positioner.

3. The method of Claim 2, further including the steps of, after said lifting and moving steps:

- a. maintaining said patient in position;

- b. removing said target positioner from said clamp; and
- c. installing said target on said clamp.

4. The method of Claim 3, further including the step of adjusting said target with respect to said clamp in three degrees of freedom.

5. The method of Claim 1, further including the step of adjusting said target with respect to said femoral head in three degrees of freedom.

6. The method of Claim 1, wherein said target has a transverse arm portion generally perpendicular to a longitudinal extent of a surgical table on which said target is mounted that facilitates transverse adjustment of the target.

7. The method of Claim 1, wherein said target has a longitudinal arm generally parallel to a longitudinal extent of a surgical table on which said target is mounted that facilitates longitudinal adjustment of the target.

8. The method of Claim 7, wherein said longitudinal arm has a bulls-eye on a top surface thereof with lines radiating

divergently from the bulls-eye that respectively connect to a plurality of parallel lines on a vertical front face of said target.

9. The method of Claim 1, wherein said mounting step includes the steps of:

- a. centralizing an intercondylar notch of said distal femur; and
- b. creating a flat plane on an anterior femoral cortex of said distal femur.

10. The method of Claim 9, further including the steps of, after said creating step:

- a. mounting an anterior condyle resector guide on said flat plane; and
- b. resecting top portions of anterior femoral condyles of said distal femur.

11. The method of Claim 10, further including the steps of, after said resecting step:

- a. mounting a frame centered on the intercondylar notch of said distal femur;

- b. mounting a distal femoral resector guide on said frame; and
- c. mounting said generator on said distal femoral resector guide.

12. The method of Claim 8, wherein said shining step shines said laser beam onto said target.

13. The method of Claim 8, wherein the laser beam is maintained parallel to the parallel lines on the vertical front face of said target to eliminate rotational error.

14. The method of Claim 13, wherein said aligning step includes the step of triangulation of the laser beam with the leg held at least 15 degrees toward a midline thereof and marking a first position of said laser beam, and comparing said first position on said target with a position of said laser beam on said target with said leg held at least 15 degrees away from said midline.

15. The method of Claim 14, wherein distance is measured between said first and second portions of said laser beam and half this distance being used to create a corrective transverse axis and

longitudinal axis in an opposite direction of a more cephalad laser beam.

16. The method of Claim 15, wherein the laser beam is adjusted at the knee joint to a location of corrective axes on said target.

17. The method of Claim 16, wherein, thereafter, said target is adjusted both longitudinally and transversely with respect to said surgical table to be parallel to the laser beam's longitudinal axis at the knee joint.

18. The method of Claim 1, after said aligning step, further including the steps of:

- a. providing a laser beam generator mount on said target;
- b. removing said generator from said knee joint; and
- c. attaching said generator to said target mount.

19. The method of Claim 18, after said attaching step, actuating said laser beam toward said distal femur along a mechanical axis of said leg.

20. A system for locating a center of a femoral head of a patient, said patient having a leg with a femoral head having a center, a femur, distal femur, knee joint and tibia, said system comprising:

- a. a frame attachable to a center of a distal femoral intercondylar notch of said distal femur;
- b. a laser beam generator mountable on an adjustable distal femoral resector pivotable on a frame mounted at said distal femur of said patient;
- c. a target mountable over said femoral head;
- d. whereby with said generator mounted on said distal femur and said target mounted adjacent said femoral head, a laser beam from said generator may be shined toward said target, and position of said target and generator may be adjusted to align said laser beam over the center of said femoral head.

21. The system of Claim 20, wherein said frame has a wing structure matching anatomy of the distal femoral intercondylar notch which includes diverging portions that typically diverge between 38-42 degrees.

22. The system of Claim 21, wherein the frame has a post at a center thereof about which said attachable distal femoral resector may pivot.

23. The system of Claim 22, wherein the distal femoral resector is adjustable through movements of an adjustment knob attached to said frame.

24. The system of Claim 20, wherein said distal femoral resector has a tapered mounting slot receiving said generator that prevents wobble of said laser beam.

25. The system of Claim 20, wherein said distal femoral resector and frame have interrelated indicia permitting determination of relative position of said frame with respect to the said resector.

26. The system of Claim 20, wherein said target includes adjusting means for adjusting target location.

27. The system of Claim 26, wherein said adjusting means is movable to adjust location of said target in three degrees of freedom.

28. The system of Claim 27, wherein said target includes a transverse arm and a longitudinal arm generally perpendicular to said transverse arm.

29. The system of Claim 28, wherein said transverse arm extends generally perpendicular to a length of said patient.

30. The system of Claim 28, wherein said longitudinal arm includes a bulls-eye on a top surface thereof with divergent lines radiating from the bulls-eye that connect, respectively, to a plurality of vertical parallel lines on a front vertically extending face of said target.

31. The system of Claim 20, wherein said target is mounted on a bracket fixed to a surgical table.

32. The system of Claim 30, wherein said target is mounted on a bracket fixed to a surgical table.

33. The system of Claim 32, wherein said top surface of said target is generally parallel to a top surface of said surgical table.

34. The system of Claim 20, wherein said generator is mountable on said distal femur with a first mount, and further including a second mount for mounting said generator on said target.

35. The system of Claim 20, wherein said laser beam generator comprises a canister with an internal chamber, a removable cover adapted to close said chamber and a laser beam source removably insertable into said chamber.

36. The system of Claim 35, wherein said canister has a bracket with a tapered shoe attached thereto for mounting said generator.

37. The system of Claim 36, wherein said canister has a wall opposite said cover, said wall having a lens aligned with said laser beam when said laser beam source is within said chamber.

38. The system of Claim 37, further including alignment means for aligning said laser beam source in said chamber.

39. The system of Claim 35, wherein said laser beam source has an outer surface on which an on-off switch is located, said

switch engaging a cooperating surface within said chamber when said laser beam source is inserted into said chamber to activate said laser beam.

40. The system of Claim 36, wherein said tapered shoe permits mounting said generator on said distal femoral resector or on said target.

41. A system for locating a center of a femoral head of a patient, said patient having a leg with a femoral head having a center, a femur, distal femur, knee joint and tibia, said system comprising:

- a) a frame attachable to said distal femur;
- b) a light beam generator mountable on said frame;
- c) a target mountable over said femoral head;
- d) whereby, with said generator mounted on said frame and said target mounted adjacent said femoral head, a light beam from said generator may be shined toward said target, and position of said target and generator may be adjusted to align said light beam over the center of said femoral head.